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A Lack of Words To Articulate A System:
Essays On The Collisions between Arts And Science "Entropy"

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A Lack of Words To Articulate A System: Essays On The Collisions between Arts And Science "Entropy"

by

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I'm not sure I find an expression of gratitude as the highest form of praise to those who have given the world to me. To me it is more of a focal point through which I can reveal all the other ways I feel truly indebted to these giants whose shoulders I now stand upon. To name everyone who has been integral to my formation, and subsequently the creation of this writing, would take an essay all to itself.

I have been so blessed in those who I have collided with throughout my life and those who I have locked orbit with. You have shifted my path like nothing else. I hope that my practice and life acts as an acknowledgement to your investment. With that in mind, though, I do want to express infinite gratitude and affection first and foremost to God, and secondly to the person I see as most influential to my development as a human - my Mother. My teacher, my mentor, my nurturer and friend, thank you for aiding me in this writing and guiding me through the madness of this existence. Its experience has been ever illogical, ever expanding, and ever beautiful. I thank everyone for all that I can never quantify. Now and in the future to come.

Abstract

The Lack Of Words To Articulate A System:
Essays On The Collisions between Arts And Science “Entropy”

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I find that it stands for me to believe that we as humans start at the same point as “time” itself. Like “time,” we exist with some kind of system that we all remain laced to. From this point of origin came some form of matter, matter coming from some kind of energy, and this energy defined by ungraspable laws. Though I feel we will never fully know or understand these laws, I do believe that, like us, they are bound to one another. From time to time we might catch a glimpse of the this overarching system that defines us as we peer off the edge of our dimensional vantage point, constructing our understanding of the universe and our reality around these glimpses. All manifesting out of our embedded ability, to see pattern. Is it possible that this vision for patterning exists as a reflection of systematic origin, an embedded reflection of the circumstances and patterned systems that created us, and that we now investigate?

In organizing our assessments of the universe, places of overlap are discovered. Overlaps reveal foundations, and these common foundations justify our ability to communicate with each other and the world around us. They open the doors for comparison and empathy, not just with other humans but all existence. Following the principals that we have learned from observing our universe backwards through time, at some point everything collides as a supercontinent of fundamental universal matter and energy. This material ultimately being a foundation for understanding, or the “Ground” on which communicative understanding is built. To me, it is the basis for the re-melding of ideas, compromise and change. In its essence it reveals that our effort directed at compromise or understanding one another, isn’t a process of changing the many components of our individual existences, but instead is one focused on finding a way to put the pieces back together. To me this acknowledging and striving for an unseen center, a coalescing point, is the beginning of criticality. It's the point where we begin

to truly see what we are, but more importantly, to identify what everything once was, and see existence as a whole; seeing our small piece of reality as incomplete. Using this human sight for systems is the origin of my artistic practice. A practice that not only seeks to acknowledge this in myself, but one that desires to reveal and investigate this nature in the greater world around me

Once a foundation or the “Ground” is established, attention and energy can then be moved to that which is constructed upon it, or to the sphere I call the Quantumetheus. Through existence in the Quantumetheus, self-awareness leads to the synthesis of ideas and the grasping of that which is beyond what we can physically experience. In thinking of a thought or concept, the thought then manifests a physical existence. This as it slips back into the realm of the Quantumetheus, its origin, the Continuum or the unquantifiable space that our ideas materialize from. All exists on this same spectrum, a spectrum from the Ground to the Quantumetheus and completed by the Continuum. All three with continual flow between, and our perceivable dimension falling within the Quantumetheus.

“The eye sees only what the mind is prepared to comprehend.”
Robertson Davies “Tempest-Tost” (1951)

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Introduction

In Munich, during the 1920's and 1930's, the descriptive term "kitsch" emerged as a means to characterize the cheap, popular, and marketable pictures, sketches, and other "artworks" that had begun to overwhelm the Munich art marketplace. By the late 1930s, the term saw a further defining in Clement Greenberg's writing "Avant-Garde and Kitsch" (1939). In this seminal text, Greenberg set out to define a hierarchical system around the interpretation of what might be considered art. By developing a spectrum between the concepts of its title, Avant-Garde and Kitsch, Greenberg constructed a value system for art that he applied to avant-garde, experimental, radical and unorthodox. Greenberg claimed that the pursuit of the avant-garde was a way to resist the "dumbing down" of culture caused by consumerism and fascism; consumerism producing a decline in taste and criticality, perpetuated by mass-production and resulted in Kitsch. Several decades later postmodern canon began to take hold as the dominant movement of thought in the arts. In many ways postmodern canon resulted as a deconstruction of its precursor. Breaking away from the prescriptiveness of the past, much of the arguments existed in direct confrontation with the ideas of modernism and the writings of Greenberg. As culture moved towards a Postmodernist focus, it began to decentralize spheres of thought, abandoning what Jean-Francois Lyotard coined as "Grand Narratives" (*The Postmodern Condition: A Report on Knowledge,* 1979). Lyotard argues that in a post-modern world, philosophies such as democracy, Marxism, Enlightenment, or those that claim to encompass the totality of knowledge on a particular subject are not defendable, and are therefore invalid.

The previous art criticisms or the modernist era, that were at times so heavily intertwined with many of the cultural and institutional failures of the past, were brought under heavy criticism; a process that may still resonate to this day as we still sort through societal inequalities, for instance, those based in gender and race. In discourse with the canon of Greenberg, numerous post-modern artists, in addition to their visual art works, developed more comprehensive theoretical and critical writings; one of these artists being Robert Smithson. Smithson would use entropy as an allegory to write about the process of information change.

The concepts of *Avant-Garde and Kitsch* and Smithson's writings pertaining to entropy, such as *Entropy And The New Monuments*, (1966) and *Entropy Made Visible, Interview with Alison Sky On Site # 4*, (1973), hold many parallels. Like Greenberg, Smithson's view on entropy also had a

connection to the mass produced; in "*Entropy and The New Monuments"* Smithson states "The slurbs, urban sprawl, and the infinite number of housing developments of the postwar boom have contributed to the architecture of entropy." I claim, the parallels of the two becomes more observable as we continue to investigate them more critically. Surveying our current Western intellectual landscape, it may be plausible to state that, in many ways, art has succumbed to information overload entropy. Maybe in part due to Postmodernism and its heavy focus on skepticism, relativism or an individualistic perception of reality, information and critical theories pertaining to aesthetics, morality, history, and ideals for society, have become so numerous that they have innately found themselves canceled out by other ideas in the broader societal scope. "It is our business not to supply reality but to invent allusions to the conceivable which cannot be presented." (*The Postmodern Condition: A Report on Knowledge,* 1979, p. 81). New philosophies now exist in comparison to the mass of information that they find themselves competing with for our attention. The biological limit of our ability to organize and understand information has been exceeded by the constant "bombardment" of an ever increasing number of ideas and theories. Gleaning from both Greenburg and Smithson, my interest is in reinvestigating the scientific laws revolving around entropy as a means to reform our understanding of the avant-garde and kitsch. Though there is a lot to be learned from the historic use of these terms, for me, their use as labels of human taste, has become obsolete. Instead I wish to use them as a means to build a conceptual construct inspired by theory of information, doing so by merging portions of their historic understanding with ideas of physics and mathematics in order to create a model for the life cycle of ideas and information.

“Entropy”

Let us begin with “entropy.” Traditionally this term is used to describe the portion of the system of thermodynamics that revolves around the diffusion of energy in the form of heat, within a closed system. This diffusion of heat energy, which results from a combination of kinetic and potential energy, ultimately creates a system where additional energy is needed in order to continue to produce work, due to the eventually exhausting the usable supply of energy in the system. This is explained by the principals of the Second Law of thermodynamics. To understand this law, it is useful to begin by first discussing the foundations of thermodynamics. The laws of thermodynamics were originally discovered by Sadi Carnot, in his study of heat engines. The first of these laws tells us about the relationship between internal energy, heat, and work, and states that energy cannot be created or destroyed, but instead only changes form. Examples of this would be internal combustion engines or steam engines used in locomotives of the 19th century. Fundamentally these engines function by absorbing heat energy and converting it to pressure. This pressure produces the work that moves pistons, which then move a camshaft that eventually connects to wheels, moving a given vehicle. A side effect of this process is that not all heat produced in a cylinder is actively used to produce work. Some portion of this heat will be dispelled and moves to locations of lower temperature. Theoretically, if we could produce a perfect engine and there was no heat loss, it would operate at 100% efficiency. Such a system could be used to run a perpetual motion machine. Unfortunately, this is not physically possible. Most heat engines are grossly inefficient and this law applies to all processes that convert energy to produce work. There are several reasons why this perfectly efficient engine can not be built. In accordance with the laws of physics, the only way a system could be 100% efficient would be if every process was completely reversible. This requires both the system and its environment to be capable of returning to their original states so that the exact same process with the same material could be completed again. The inability to achieve this is actually a sign of the one directionality of processes, or time vector. It is a principle known as Carnot’s Theorem.

It is commonly understood that any real world engine involves moving parts and is therefore subject to friction and vibration. These actions result in the loss of energy through the movement of molecular structures. But, this result isn’t an absolute based off the principles that construct the

First Law of Thermodynamics, to explain this Carnot developed thermodynamics second law. This law, also known as the Law of Increased Entropy, states that heat will always spontaneously flow from regions of high temperature to regions of low temperature; energy tends to seek a state of balance. This could be phrased saying that within any cyclic process some quantity of heat won't be entirely converted into work. Some amount of this heat will always be lost to the surrounding environment of lower temperature. This perpetual loss of heat energy is called entropy. Entropy represents the inevitable partial loss of energy that occurs in conjunction with a heat engine's ability to do work. To date, no process has been created or discovered that is truly reversible, and so, in order to continue any process we must continue to add energy to a closed system. With this in mind, it is safe to assume the entropy of the universe is always increasing. This is another common articulation of the second law. The implications of this are so astounding that they have had cultural and philosophical effects. Entropy could be seen as the delineator of time. Above the quantum realm, entropy exists as the one directional change of the universe. It is commonly stated to mean disorder, and it shows that the universe tends to move towards maximum disorder. Not to say that order can't spontaneously form on a local level, like when water freezes to form ice, or in the case of any living organism like ourselves. These events always require a dispersal of energy that in theory adds more entropy to the universe as a whole than it does order. To rationalize this process of entropy, and why there are these localized moments of ordering, or what Erwin Schrödinger describes in the book *What is Life* (1944) as negentropy; it is useful to understand the concept of micro states, introduced by Ludvig Boltzmann.

In 1877 Boltzmann developed a probabilistic way to visualize the entropy of a group of gas particles. Boltzmann discovered that the likelihood of entropy to always be in conjunction to the natural logarithm of the number of all the possible microstates said gas could occupy. In his study, a microstate exists as a representation of one of the possible configurations of all the particles within the given system. For example, if you were to create a tree with branches for all the possible results of a closed system, each or those branches would be a microstate. Boltzmann's study of entropy through microstates explained that the dispersal of matter and energy, or the increase in entropy, is statistically the most likely state to occur out of all possible microstates. This is best visualized with a common box example (Figure 1). This example is comprised of two boxes and 4 different color circles. For this example, the 4 circles must end up within the boxes in some configuration. If you present all the possible ways with which the 4 colored circles can be

distributed amongst two boxes, be it all four in box one, three in one and one in the other, or finally, two in each box, as well as all the different color combinations of each of these configurations, you will notice that some configurations will end up with more possible microstates than others. According to Schrödinger, if the configurations are randomly chosen, than all configurations have the same likelihood of occurring. Therefore statistically the most probable result will be the one with the most possible microstates. In this example, the states with the circles most spread out, are the most common. This is also true of all closed systems. The possibility of a diffused or entropic system is always more probable than any other. The likelihood of landing on a system with a two and two configuration is roughly 40 percent. This is a simplified version of why entropy tends to increase in a closed system. It is important to note that 40 percent or twice as much as the next most likely option is actually a super low likelihood of entropy. This only occurs in extremely simple examples. The more variables you add, the larger this favor for entropy increases. When you get to super complex models of real world systems, this percentage, also known as Avagadro's number, becomes so large that entropic microstates essentially become the only states that will ever be seen. For comparison to Boltzmann the number of molecules, which could be seen as the circles, in twenty liter bottle of gas at room temperature and atmospheric pressure is roughly 6×1023. This complex system could be anything from the transfer of heat energy from hot to cold spaces in an engine, which on the molecular level is exponentially more complex than a twenty liter bottle of gas, to the expansion of the universe. All these things undergo processes the produce "work", but are always defusing energy or spreading matter in a way that is irreversible.

Figure 1: Visual aid to explain the probability of microstates in statistical entropy

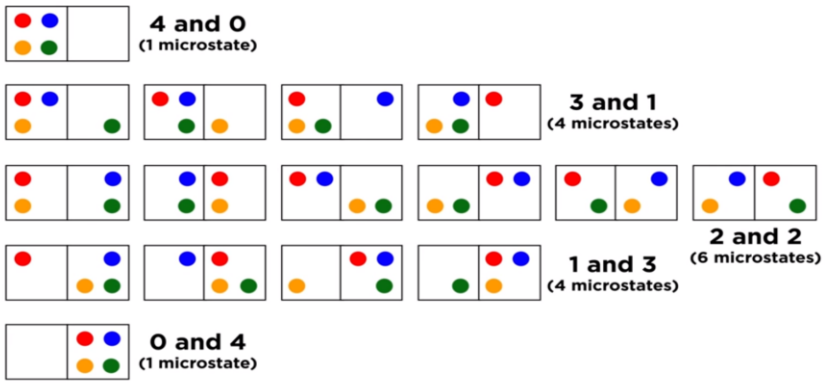

Image from, Dave Farina

“Avant-Garde and Kitsch”

Defined as “Art, objects, or design considered to be of poor taste because of excessive garishness or sentimentality, but sometimes appreciated in an ironic or knowing way”(Oxford), kitsch or kitschy is the term used to reference a realm of human production that is considered as gaudy, tacky or, common. Though considered by many to be outdated, the term has found application in fields such as the Arts, Design, Architecture, Literature, Photography, Cinema and Music. It’s also been used to describe pop cultural icons, especially those which use “high art”, or art that is easily understood and consumed. In *The Unbearable Lightness of Being* (1984), Milan Kundera writes, “Kitsch causes two tears to flow in quick succession. The first tear says: How nice to see children running on the grass! The second tear says: How nice to be moved, together with all mankind, by children running on the grass!” In essence, it is the thing that is so known to be what it is, so understood, so accepted to mean or represent an idea, that all of culture without argument interprets it that way. In a way kitsch is not something you have to think about, all the conceptual decisions have already been made leaving little criticality or contemplation. This is a realm of thought that could be viewed as the antithesis of the arts.

According to art philosopher Denis Laurence Dutton, kitsch originated during the 19th century with the advent of the bourgeois realism of salon painting and sculpture. Referencing several works of the movement, Dutton states that “Some late Pre-Raphaelite work, with romantic fantasies of a medieval golden age, lies on the boundary of kitsch, while saccharine evocations of Classical themes by such painters as William-Adolphe Bouguereau and Lawrence Alma-Tadema often cross the line. Bell (1914) denied that Luke Fildes’s The Doctor (exhib. RA 1891; London, Tate) was a work of art because its effect relies wholly on its sentimental subject-matter.” In essence the work placed its conceptual relevance so wholeheartedly on common sentiment that it became kitsch. It existed to perpetuate this sentiment, and not to add anything to it. Probably one of his most relevant references to kitsch of the last century is an analysis of Marcel Duchamp’s Mona Lisa presented in *L.H.O.O.Q*. (1919). Dutton, “Solemnity and a complete absence of irony also mark kitsch: this distinguishes sharply the presentation of a bearded Mona Lisa in Marcel Duchamp’s *L.H.O.O.Q*. (1919) from the kitsch appearance of Leonardo’s painting on the top of a jewelry box. By poking fun at high art idolatry, Duchamp and the Dadaists pitted themselves against kitsch and initiated a post-war tradition that became a factor of later Pop art and the irreverent strains of

Postmodernism.” Like no other of the time, Duchamp chose the most amazing gesture of harmonious contradiction. Denis Laurence Dutton mentions, in Duchamp using the cheap reproduction, which in every sense of its existence, lived in the realm of kitsch, and not only very slightly modifying but also representing it as his own; the work is simultaneously referencing its existence or origin as a kitschy item but also is existing as avant-garde in the battle it stages between Fine Art and High Art. It acted much like internet memes do today: being an object whose subject matter and concepts are superpositioned between two opposing spaces of thoughts.

Clement Greenberg’s *Avant-Garde and Kitsch* was an attempt to define the parameters of what he understood to be fine art or the Avant-Garde during the middle of the nineteenth century; this time being the high modernist era of art. Defined by Greenberg as the new, revolutionary or that which is pushing against the boundaries of existing canon within popular culture, the Avant-Garde, or the fore-guard, was considered to be the qualifying factor for what was to be considered relevant in the artistic sphere. In contrast to this idea of the new, irregular and experimental, Greenberg did little to reform kitsch from its original meaning but used it as a means to place emphasis on that which was mass produced or fully explored, understood and gaudy. According to the essay, ideas and artistic practices first begin as avant-garde. They are new, uninvestigated or non-understood patterns of thought and, experimental processes of working. Stating “All profoundly original art looks ugly at first.” (*Clement Greenberg Between the Lines: Including a Previously Unpublished Debate with Clement Greenberg*, 1996). As we further investigate these ideas and vet them out to the point of understanding, the idea finds its way from the state of avant-garde to that which is kitsch, entering it into the rolodex of human culture and making its way to the surface of understandings. I suggest that in contemporary context kitsch could be represented by things such as fuzzy dice hanging from the rear view mirror of a car, the ever famous Troll Dolls, a Wal-Mart reproduction of a Michelangelo paintings or any object that is produced solely for its common sentiment. All such items in a contemporary context have reached a state of common cultural understanding and can be considered kitschy. These things can at times be criticized through ironic gesture like was the case with Duchamp’s L.H.O.O.Q., reinvigorating an object considered kitsch but, as David Foster Wallace explains, irony may also have fallen victim to kitsch as well. Wallace states “Few artists dare to try to talk about ways of working toward redeeming what's wrong, because they'll look sentimental and naive to all the weary ironists. Irony's gone from

liberating to enslaving." (*Conversation with David Foster Wallace,* 1993). Wallace believed that a failure of the postmodern society was that even irony itself had to become an action of cultural normality, and less of an opportunity to open the door to criticism.

“Greenberg”

Clement Greenberg, is considered by many to be the most influential visual art critic of the modernist era. At one time he was praised for his writings as well as the championing of several modernist artists, perhaps most notably, Jackson Pollock. *Dictionary of Art Historians* (2000) Greenberg made a name for himself as a visual art critic with his essay “Avant-Garde and Kitsch.” This distinct and abrasive assessment of art and the degradation of culture were laid out in a manner which praised the “purity” of the Avant-Garde or that which was detached from the common understanding of culture. Greenberg believed that representation prevented the true essence of art to be seen, calling more attention to its imagery and denying art its ability to truly be art. “Realistic, naturalistic art had disassembled the medium, using art to conceal art; Modernism used art to call attention to art.”(*The Collected Essays and Criticism, Volume 4: Modernism with a Vengeance, 1957-1969* (1995). Kitsch was academicism or synthetic art that had been understood to the point of easy digestion by, and therefore easy manipulation of, its viewer. “Where Picasso paints cause, Repin paints effect. Repin predigests art for the spectator and provides a short cut to the pleasure of art that is necessarily difficult in genuine art. Repin, or kitsch, is synthetic art.” (*Art and Culture: Critical Essays*, 1971).

After *“Avant-Garde and Kitsch,”* Greenberg would write numerous other essays that were critical of the arts such as *Towards a Newer Laocoon*, (1940), in which he gave the framework for his understanding of the development of modern art, as well as the essay *Modernist Painting* (1960), which as the name suggests, defined the values of painting during the modern era of art. Over time Greenberg’s intense commitment to his views of what was to be considered high art created what today might be seen as a sort of bully like, though I personally do not hold this opinion. Like artists of today, Geenberg simply argued and defended the ideals he truly believed in. A disciple of his position , Greenberg empowered the careers of notable artists such as Jackson Pollock and Mark Rothko, but he has also been critical of them to the point of reforming their work to fit his aesthetic framework. It is documented that when managing David Smith's estate, he scraped the paint off some of the sculptures and left them to partially rust, because he felt that they didn't adhere to a formalist ideal; stating that the sculptures were unfinished and their surfaces in bad condition. By stripping the paint, allowing them to rust, and then varnishing them, Greenberg argued that he had returned them to a more authentic state. Though occasionally a part of Smith's,

Clement did so in opposition to the others charged with the artist's work. "*Clement Greenberg: A Life"*(1997) By the 1950's, Greenberg had become one of the guiding forces in American art. In 1955 he wrote *American-Type Painting*, an essay which claimed abstract-expressionism as the next direction for modernist art and glorified not only the work of Jackson Pollock but also that of expressionists such as Clifford Still, Willem de Kooning and Hans Hofmann. *A Life on Art's Barricades* (1998) Greenberg saw these artists use of the material as medium specific and pure in its application and concept. But, as all things should, even what Greenberg praised as avant-garde, the work of the abstract expressionists, was subject to becoming kitsch as well. In response to this, in 1964 Greenberg would curate a show titled *Post-Painterly Abstraction* and write an accompanying essay. Comprised of thirty one artists, including Ellsworth Kelly, Thomas Downing, Paul Feeley, Sam Francis, Helen Frankenthaler, Ray Parker, David Simpson, Albert Stadler, Frank Stella. Greenberg saw this show as the next phase in painting beyond Abstract Expression. *Post-Painterly Abstraction,* consisting of painting styles such as, hard-edge painting, lyrical abstraction, and color field painting, presented work that avoided the mannerisms of the abstract expressionist paintings before it. Despite his art critical effort, Greenberg began to lose influence. With the growing influence of Minimalism, Pop Art, Conceptual Art, including Robert Smithson, and other postmodern movements of the 1970s, artistic critical discourse slowly began to decentralize, no longer giving focus to a single or even a few closely connected artistic movements (*Clement Greenberg: A Life,* 1997).

“Smithson”

Several decades after Greenberg’s “Avant-Garde and Kitsch”, Robert Smithson, began to become in an influential figure in the New York art scene. As an artist he not only took interest in the production of art, but also art criticism and theoretical writing. Born in Rutherford, New Jersey, in 1938, Smithson spent a great deal of his childhood fascinated with nature. As he matured into adulthood, his ability as an artist granted him an opportunity to study at the Art Students League in New York where he would attend for two years (1955-1956). At this time, Smithson would spend most of his time producing abstract paintings. During this period he came into contact with several minimalist artists via his dealer, one of which was Nancy Holt. Possibly from this influence, Smithson would transition into making sculpture. It was also during this period that his childhood interest in nature seemed to merge with his mature interest in conceptualism. Out of this he would begin to produce the works he is most known for. In addition to being a major figure in the land art movement, a large portion of Smithson artistic practice involved writing. Over his short life and career he would write extensively. Several of these essays focus in on the physical process of entropy.

Smithson’s fascination with this constant diffusion of physical energy is not only evident in the subject matter of his sculptural works, but was also covered, at length, in his writing interviews. While writing extensively on time, decay and the idea of the monument he often wrote on correlation between the scientific law of entropy and the idea of conceptual breakdown. Similarly to the proliferation and decline of abstract expressionism causing it to become kitschy and fought against by post-painterly abstraction Smithson too speaks of intense proliferation and entropy of information: “In information theory you have another kind of entropy. The more information you have the higher degree of entropy, so that one piece of information tends to cancel out the other.” (*Entropy Made Visible*, 1973)

Smithson viewed the entropy of information or ideas as almost an information overload. A simplified example of this might be our excitement in relation to a new object or event in our life. As we all can attest, it is common to present an intense reactive response to first time experiences. Because of this, memory recollection of such experiences is far greater. But, as we continue to experience the same thing over and over again, the subjects adapt. With a single cohesive event or action there is clarity, but entropy of that action comes when a large amount of different information pertaining to that same action is amassed. This disorders and desaturates the solid

concentration of its original understanding. It is a way by which the potency of an idea changes form and decays. Throughout his career Smithson constantly intertwined his views of this “entropy of concept” into his work. These ideas are clearly laid out in his interview *Entropy Made Visible* (1973). Even after his death, Smithson’s (1973) earth works still emphasize his sense of the conceptual entropic process. This may be seen in Spiral Jetty located in the Great Salt Lake of Utah. The Jetty sits as a massive spiral of over six thousand tons of black basalt rocks, salt crystals and earth from the site stretching out into the salty waters of the lake, only to then swirl in upon itself. The Jetty is, in many ways, unusable, but stands as a monument that for a time succumbed to the retaking by nature as it was swallowed by the rise of the Salt Lake Basin. It would later reemerge, changed, subjected to a local syntropic event, and now completely covered in the crystalline salt. The object that had been subject to physical entropic breakdown, simultaneously became conceptually syntropic or avant-garde.

“Expansion”

It would appear that Smithson’s writings and definition of entropy hold a significant semblance to Greenberg’s approach and arguments of the *Avant-Garde and Kitsch*. I would argue that Smithson’s understanding of entropies effect on information is, in many ways, a redefinition of what Greenberg saw as kitsch, simply void of Greenberg’s hierarchical values. Smithson and Greenberg, in my opinion, both present this kind of diffusion of the concept energy around a given idea, one that starts at a point of concentration, completely focused, and changing towards a state of complete nullification and diffusion. I find that there is more to glean from this study of and comparison to entropy in thermodynamics. Interestingly enough, once we make the correlation between physical entropy, conceptual entropy and, kitsch, we are faced the possibility of theorizing about other aspects of thermodynamics and comparing what we have discovered about the theory of knowledge or information theory.

A key measure in this information theory is "entropy". Let’s reason that because ideas and creativity are forms of energy and therefor are subject to the entropic process in the same way all other energy is. With that being said, like energy, information and knowledge, which I'll call energy in cognitive form, fundamentally lacks the ability to be created, nor can it be destroyed; it simply changes forms. This might seem like a confusing premise to start with, especially when it pertains to artistic ideas, but reason with me. By first understanding the scientific bounds of our existence, starting first with matter and energy, which everything is constructed of, we must conclude that even cognitive energy, which is ultimately based in bio-chemical processes and produces our thoughts, is subjected to these laws as well. Evan Warfel writes, “But the neurons in your brain don’t use any particular cell ‘state’ to encode information. Instead, your neurons keep track of information by pulsing, rapidly releasing electro-chemical discharges and then recharging.” (*Consciousness is an Inevitable State of Matter,* 2017*)*, or Steven Pinke explains “Consciousness surely does not depend on language. Babies, many animals, and patients robbed of speech by brain damage are not insensate robots; they have reactions like ours that indicate that someone's home.” (*The Brain: The Mystery of Consciousness,* 2007). It helps to think of the cells of our brain as units of storage for pulsing energy that make up cognitive action. A great example is a computer. Digital computers store all sorts of digital information, but all of that information exists simultaneously in a very physical form. Temporary data stored within R.A.M., saved data embedded in a hard drive, and even transferring data is a physical change to the

electromagnetic field. Like this, our thoughts and ideas are also attached to physical event, and are therefore subject to the laws of physics. Not to say that all human ideas exist, but more so that the combination of matter and energy that they are generated from is theoretically limited, therefore they too must be. This system is just so complex, and so incredibly vast, that it is impossible for us as humans to even begin to interpret. Simply put the things we have yet to think are combinations of matter and energy that haven't occurred yet, and at the same time converted to cognitive energy. We don't fully understand what physiological events take place in the core of our physical brains when our minds think thoughts, but we can assume that one in fact does take place. Like the computer analogy, we are simply ignorant of the physical manifestation of these events. I would further say that a portion of this process of converting matter to energy, and vice versa, may just be one of the side effects of our bodies physically navigating through existence, possibly even being influenced, in a small part, by another systems entropic diffusion of energy. To eat certain foods provides the body with slightly different chemicals producing different electro-chemical processes, and subsequently a slightly different effect upon our thoughts. Similarly, to go on a walk, subjects the body to different environmental conditions which, in turn, do the same thing. To move is to transfer the potential energy stored in food to the body, converting it to work/action, but some of that energy also goes to the action of cognitive processing. We are also absorbing energy constantly in a myriad of ways. So with this we must accept that there is theoretically a limit to the matter and energy in the universe, however inconceivable that amount is, and that there is a limit to the amount of ideas to be thought; that limit too being equally inconceivable.

It is amazing that we as artists, or maybe simply as human beings, seem to vigorously fight against what we might call a state of equilibrium, stagnation or disorder. As a species, humans appear to always seek to progress. But, As the Second law of Thermodynamics states heat will always spontaneously flow from regions of high temperature to regions of low temperature. Within a closed system, any process that is producing work is, in part, producing and defusing energy as heat. The same might be said for this idea energy in its progression towards entropy. As information is consumed and diffused within the realm of thought, new systems of thought must be consumed and as a result dispersed in order to maintain the potency of the consuming system. Picture a super fine but slow moving liquid. If you dump a bucket of it on a flat surface, it would initially make a mound. But as it remained there, it would slowly level, to a perfectly leveled layer. To maintain the mound, more of this liquid must continually be added. As we move both towards a

more massive and also more homogeneous world culture, our potential to find and glean from isolated points of negentropy minimize. As a statistical study of entropic progression through microstates has shown us, the more complex a system, the lower the likelihood isolated negentropic events become. For example, our coming together and developing as complex intelligent life exists as a result of one of the rarest of paths for matter and energy. Maybe being products of this rare occurrence, we too seek naturally to perpetuate it. But, being that diffusion is the preferred direction of energy, without an even greater consumption of energy; diffusion will always be the result. And though a system with more parts has greater potential energy within it, it is nearly impossible for even small portions of the potential to coalesce.

Though I am not arguing for one myself, in our humanity one could most certainly claim that a universal hierarchy or value system has emerged between *Avant-Garde* and absolute entropy; A system established through patterning caused by the laws of physics. But I would argue that constructing such a hierarchy is an anthropomorphization. We as humans, being a species so bound to time and fascinated by the ephemeral, will naturally seek out and praise the state of the avant-garde. The avant-garde can only be maintained temporarily. Anything we value due to its potency, newness or order, will inevitably be lost to the slow effects of entropy. A simple example might be the human love of, and desire to make the most of our time as youth. With time comes the effect of entropy or age. All youth have the possibility to be given age, but no elderly the gift of youth. Even as Aristotle, in all his pondering concluded that beauty in part is that which is difficult and ordered. What then is more difficult, and in turn more beautiful, than maintaining the order of our little section of the universe. But, this beauty exists entirely in the eyes of its beholder. The universe has no value system, simply the binary of cause and effect. These binary principles build the foundation of the complex world around us. As Alan Turing defines in the article "The Chemical Basis of Morphogenesis"(1952), something as simple as Boolean logic, or true or false, can explain complex patterning of nature. This is also the foundational logic system for the modern computer. Instead of viewing the world through the lens of traditional value systems, I instead find it more useful to view things through the lens of complexity science (“*Social networks as embedded complex adaptive system*s”, 2010), viewing classical physics, mathematics, and theories of knowledge, as human definitions of universal behaviors within a system of reality. These behaviors dictating how all the components of said system interact and form relationships.

For quite some time I saw this exponential expansion of the arts and culture almost as a singularity which has expedited the entropic progression towards absolute zero. With the advent of mass communication and access to more information than ever possible, it would in many ways appear that we are speeding towards a point of mass information diffusion, with no ability to concentrate the energy of artistic investigation. I feared that information overload had begun to inhibit our ability to focus on what might be considered the avant-garde, specifically in the arts and culture. This, resulting in a futility in my own artistic investigations. But, having explored the correlations between kitsch or the process of Cognitive Entropy to that of scientific or physical entropy, I think I have been lead to reconsider this understanding. This arose when I considered the Third Law of Thermodynamics.

Let us recap. The First Law of Thermodynamics tells us about the relationship between internal energy, heat and work, and states that energy cannot be created or destroyed, but only changes form. It, in essence, states that within our system there is no loss or gain, simply change. The Second Law then states that the flow of energy is always from spaces of hot to cold, or from concentrated to diffused. So when using the Second law to help define systems of idea development, it expresses the directional aspect of its development and that energy has a preference for moving apart. It also traps cognitive entropy in time, since reversing work simply creates an even greater amount of entropy in a system. Finally, the Third Law of Thermodynamics states that the rate of entropy of a system approaches a constant value as its temperature approaches absolute zero, meaning that as a system moves closer and closer to absolute zero, its cooling occurs at a slower and slower rate. Despite the fact that absolute zero is an important theoretical concept according to this law, it may actually be impossible to achieve. This law opens the possibility that cognitive entropy of our system might only increases at a fractional rate, always minimizing as entropy increases. Therefore absolute entropy of any system may be an impossible state to achieve. Though diffusion and spreading is continuous, and the bond between matter and energy always increasing, the gap between matter could be considered an infinitely more precise irrational number. This entropic point also requires a vacuum of absolute zero to prevent the heat in the environment around an object, from traveling back to said object being cooled. Historically it was believed that an accurate and non-biased record of history could be made, as if the information of the past could be placed in a similar theoretical vacuum and its events precisely recorded; and similarly we now understand this to be an impossibility as well. As psychiatrist Dr.

Morgan Scott Peck explains “Human beings are poor examiners, subject to superstition, bias, prejudice, and a profound tendency to see what they want to see rather than what is really there.”(People Of The Lie, 1983).

We might also be able to make a correlation between this absolute cognitive entropy and what we might call “absolute truth.” As Heisenberg's Uncertainty Principle tells us, “we cannot measure the position and the momentum of a particle with absolute precision. The more accurately we know one of these values, the less accurately we know the other.” I would say, similar to the molecular structures of gases in Boltzmann’s research, information may also adhere to such a principle. We could relate truth to the measure of entropy of information on a given subject. This would include understanding its cognitive energy’s structure and the velocity of those structures spread simultaneously. In this, because at absolute entropy no further change would occur, all possible information within this cognitive energy’s structure would now exist and could be known. Beyond this, if any amount of velocity was present, the amount of information around a subject would be increasing. At the state of absolute entropy, in theory, there is no velocity. Anything at absolute zero has no activity and its position and velocity would be able to be calculated simultaneously. Thought this state is impossible, if such a theoretical event of an object at absolute zero did happen and was maintained, all measurements made on such a thing would remain constant. A similar thing could be said about knowledge of a given subject. At the point of complete cognitive entropy there would be absolutely zero expansion of knowledge within the given system, and therefore we could say that “absolute truth” is now possible to achieve. Of course as we have mentioned using the third law of thermodynamics, this is quite possibly impossible. To fully know anything can only happen if that thing could potentially reach a completely stagnate space, which in theory is impossible to reach. Though the expansion of knowledge may significantly slow down, we understand it will never stop, making “truth” impossible to achieve. This construct of truth acts as Moyo Okediji called an “extension of and challenge to modernism and postmodernism” (*Transatlantic dialogue: contemporary art in and out of Africa,* 2000) known also known as metamodern. Not abandoning, what Lyotard called the “grand narrative” (“*The Postmodern Condition: A Report on Knowledge”,* 1979), but instead proposing that a grand narrative might exist but also can never be fully known.

These laws in tandem state that the process of development or cooling is forever on-going, and will simply slow down but continue to occur to the infinitesimally smallest degree. Therefore, like

entropy, a state of absolute kitsch may be useful to theorize, but is ultimately impossible to achieve. This would state that the process by which art, information, entropy and kitsch progress will always be a fractional process, forever experiencing a smaller and smaller degree of change. In this, perhaps, all human investigation will always give at least some minute amount to “progress”, or hold some amount of value, no matter how small. This is a theoretical, slow and continual end of our systems of thought, but to assume that we are anywhere near approaching this would be absurd. Though these theories might reflect isolated systems, like our physical universe, the scope of the system of cognitive thought is inconceivably vast, and with it an incalculable number of states for cognitive energy to be created.

In this, we should not be saddened by the prospect of entropy of ideas, but instead be encouraged by it to perpetually wonder, always seeing value in the investigation of even the most common place of ideas an objects around us. For me, this is where the artistic practice gains it's validity. I personally see art as an opportunity to question accepted constructs of reality. It is a chance to bring new light to the overlooked portions of our existence, and open up the possibility for further human discoveries and explore unseen connections.

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